

IN THE CLAIMS:

Please AMEND claims 1, 11, 12, 16, 17, 18, 20, and 21, and ADD claims 22-26, as follows. For the Examiner's convenience, all claims currently pending in this application have been reproduced below:

1. (Currently Amended) An ~~electrooptic~~ electron optical system array having a plurality of electron lenses, comprising:

A2 at least two electrode structures which respectively include membranes ~~each~~ having a plurality of apertures and are arranged along an optical axis, each of the membranes having a plurality of apertures through which charged-particle beams pass; and

a spacer which is interposed between the facing membranes and adjacent to the apertures and which determines a gap between the facing membranes.

2. (Original) The array according to claim 1, wherein said spacer includes an insulator.

3. (Original) The array according to claim 1, wherein said spacer is made of photosensitive glass.

4. (Original) The array according to claim 1, wherein said spacer is arranged at a position where said spacer does not close the apertures of each membrane.

5. (Original) The array according to claim 1, wherein said spacer includes a plate having a plurality of apertures at positions corresponding to the plurality of apertures of each membrane.

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6. (Original) The array according to claim 1, wherein  
said spacer includes a plurality of members having apertures, and  
the plurality of members are arranged to make positions of the apertures of the plurality of members coincide with positions of the plurality of apertures of each membrane.

7. (Original) The array according to claim 1, wherein at least one of said at least two electrode structures comprises:

a plurality of electrically independent wiring lines; and  
a plurality of electrode members connected to the plurality of wiring lines.

8. (Original) The array according to claim 1, wherein at least one of said at least two electrode structures has a single electrode member common to the plurality of apertures.

9. (Original) The array according to claim 1, wherein the electrode structures respectively have supports for supporting the membranes.

10. (Original) The array according to claim 9, further comprising a member which is interposed between the supports of said facing electrode structures and determines a gap between the facing supports.

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11. (Currently Amended) The array according to claim 9, wherein the supports of said facing electrode structures respectively have grooves at facing positions, and

the ~~electrooptic~~ electron optical system array further comprises a fiber which is between the facing grooves and defines a gap between the facing supports.

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~~12.~~ (Currently Amended) An ~~electrooptic~~ electron optical system array having a plurality of electron lenses, comprising:

at least two electrode structures which respectively include membranes ~~each having a plurality of apertures~~ and are arranged along an optical axis, each of the membranes having a plurality of apertures through which charged-particle beams pass; and

a plurality of spacers which are located in a gap of the facing membranes and adjacent to the apertures and which determine the gap at a plurality of positions of the facing membranes.

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~~13.~~ (Original) The array according to claim ~~12~~, wherein each of said plurality of spacers includes a columnar member.

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~~15~~ 14. (Original) The array according to claim ~~12~~ 13, wherein each of said plurality of spacers includes a linear number.

~~16~~ 15. (Original) The array according to claim ~~12~~ 13, wherein each of said plurality of spacers has a dice shape.

A2 ~~17~~ 16. (Currently Amended) The array according to claim ~~12~~ 13, wherein each of said plurality of spacers has a cylindrical shape having a second aperture, an axis of the second aperture according with that of the aperture of each membrane.

~~19~~ 17. (Currently Amended) A charged-particle beam exposing apparatus comprising:  
a charged-particle beam source for emitting a charged-particle beam;  
an ~~electrooptic~~ electron optical system array which <sup>has</sup> ~~as~~ a plurality of electron lenses and forms a plurality of intermediate images of said charged-particle beam source by the plurality of electron lenses; and

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a projection ~~electrooptic system~~ electron optical system for projecting on a substrate the plurality of intermediate images formed by said ~~electrooptic system~~ electron optical system array,

said ~~electrooptic~~ electron optical system array including:

at least two electrode structures which respectively include membranes ~~each~~  
having a plurality of apertures and are arranged along an optical axis, each of the membranes  
having a plurality of apertures through which charged-particle beams pass; and

a spacer which is interposed between the facing membranes and adjacent to the  
aperture and which determines a gap between the facing membranes.

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18. (Currently Amended) A device manufacturing method comprising the steps of:

installing a plurality of semiconductor manufacturing apparatuses including a  
charged-particle beam exposure apparatus in a factory; and

manufacturing a semiconductor device by using the plurality of semiconductor  
manufacturing apparatuses,

the charged-particle beam exposure apparatus having:

a charged-particle beam source for emitting a charged-particle beam;

an ~~electrooptic~~ electron optical system array which has a plurality of electron  
lenses and forms a plurality of intermediate images of the charged-particle beam source by the  
plurality of electron lenses; and

a projection ~~electrooptic~~ electron optical system for projecting on a substrate the  
plurality of intermediate images formed by the ~~electrooptic system~~ electron optical system array,

the ~~electrooptic~~ electron optical system array including:

at least two electrode structures which respectively include membranes ~~each~~  
having a plurality of apertures and are arranged along an optical axis, each of the membranes  
having a plurality of apertures through which charged-particle beams pass; and

a spacer which is interposed between the facing membranes and adjacent to the  
apertures and which determines a gap between the facing membranes.

A2 ~~21~~ ~~20~~ 19. (Original) The method according to claim 18, further comprising the steps of:

connecting the plurality of semiconductor manufacturing apparatuses by a local  
area network;

connecting the local area network to an external network of the factory;

acquiring information about the charged-particle beam exposure apparatus from a  
database on the external network by using the local area network and the external network; and

controlling the charged-particle beam exposure apparatus on the basis of the  
acquired information.

~~22~~ 20. (Currently Amended) A semiconductor manufacturing factory comprising:

a plurality of semiconductor manufacturing apparatuses including a charged-  
particle beam exposure apparatus;

a local area network for connecting said plurality of semiconductor manufacturing  
apparatuses; and

a gateway for connecting the local area network to an external network of said semiconductor manufacturing factory,

said charged-particle beam exposure apparatus having:

a charged-particle beam source for emitting a charged-particle beam;

an ~~electrooptic~~ electron optical system array which has a plurality of electron lenses and forms a plurality of intermediate images of said charged-particle beam source by the plurality of electron lenses; and

A2 a projection ~~electrooptic~~ electron optical system for projecting on a substrate the plurality of intermediate images formed by said ~~electrooptic~~ electron optical system array,

said ~~electrooptic~~ electron optical system array including:

at least two electrode structures which respectively include membranes ~~each~~ having a plurality of apertures and are arranged along an optical axis, each of the membranes having a plurality of apertures through which charged-particle beams pass; and

a spacer which is interposed between the facing membranes and adjacent to the apertures and which determines a gap between the facing membranes.

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21. (Currently Amended) A maintenance method for a charged-particle beam exposure apparatus, comprising the steps of:

preparing a database for storing information about maintenance of the charged-particle beam exposure apparatus on an external network of a factory where the charged-particle beam exposure apparatus is installed;

connecting the charged-particle beam exposure apparatus to a local area network in the factory; and

maintaining the charged-particle beam exposure apparatus on the basis of the information stored in the database by using the external network and the local area network,

the charged-particle beam exposure apparatus having:

a charged-particle beam exposure source for emitting a charged-particle beam;

A2 an ~~electrooptic~~ electron optical system array which has a plurality of electron lenses and forms a plurality of intermediate images of the charged-particle beam source by the plurality of electron lenses; and

a projection ~~electrooptic~~ electron optical system for projecting on a substrate the plurality of intermediate images formed by the ~~electrooptic~~ electron optical system array,

the ~~electrooptic~~ electron optical system array including:

at least two electrode structures which respectively include membranes ~~each~~ having a plurality of apertures and are arranged along an optical axis, each of the membranes having a plurality of apertures through which charged-particle beams pass; and

a spacer which is interposed between the facing membranes and adjacent to the aperture and which determines a gap between the facing membranes.

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--22. (New) The array according to claim 1, wherein said spacer is arranged at a position between the neighboring apertures.



~~18~~ 13. (New) The system according to claim ~~12~~ 13, wherein each of said plurality of spacers is arranged at a position between the neighboring apertures.

24. (New) An electron optical system array having a plurality of electron lenses, the array comprising:

A2 at least two electrode structures respectively including membranes and supports, each of the membranes including a first region having a plurality of apertures through which charged-particle beams pass and a second region surrounding the first region, the supports arranged to support the second regions of the membranes, the at least two electrodes structures arranged along paths of the charged-particle beams; and

a spacer interposed between the first regions of the facing membranes and determining a gap between the facing membranes.

25. (New) A charged-particle beam exposure apparatus comprising:

a charged-particle beam source for emitting a charged-particle beam;

an electron optical system array which has a plurality of electron lenses and forms a plurality of intermediated images of said charged-particle beam source by the plurality of electron lenses; and

a projection electron optical for projecting on a substrate the plurality of intermediate image formed by said electron optical array,

said electron optical system array including:

at least two electrode structures respectively including membranes and supports, each of the membranes including a first region having a plurality of apertures through which charged-particle beams pass and a second region surrounding the first region, the supports arranged to support the second regions of the membranes, the at least two electrode structures arranged along paths of the charged-particle beams; and

a spacer interposed between the first regions of the facing membranes and determining a gap between the facing membranes.

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26. (New) A device manufacturing method comprising the steps of:

installing a plurality of semiconductor manufacturing apparatuses including a charged-particle beam exposure apparatus in a factory; and

manufacturing a semiconductor device by using the plurality of semiconductor manufacturing apparatuses,

the charged-particle beam exposure apparatus having:

a charged-particle beam source for emitting a charged-particle beam;

an electron optical system array which has a plurality of electron lenses and forms a plurality of intermediate images of the charged-particle beam source by the plurality of electron lenses; and

a projection electron optical system for projecting on a substrate the plurality of intermediated images formed by the electron optical array,

the electron optical system array including:

at least two electrode structure respectively including membranes and supports,  
each of the membranes including a first region having a plurality of apertures through which  
charged-particle beams pass and a second region surrounding the first region, the supports  
A<sup>2</sup> arranged to support the second regions of the membranes, the at least two electrode structures  
arranged along paths of the charged-particle beams; and  
a spacer interposed between the first regions of the facing membranes and  
determining a gap between the facing membranes.--

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